

Animal Meal Utilization in Cement Kilns

Holcim's European Experience

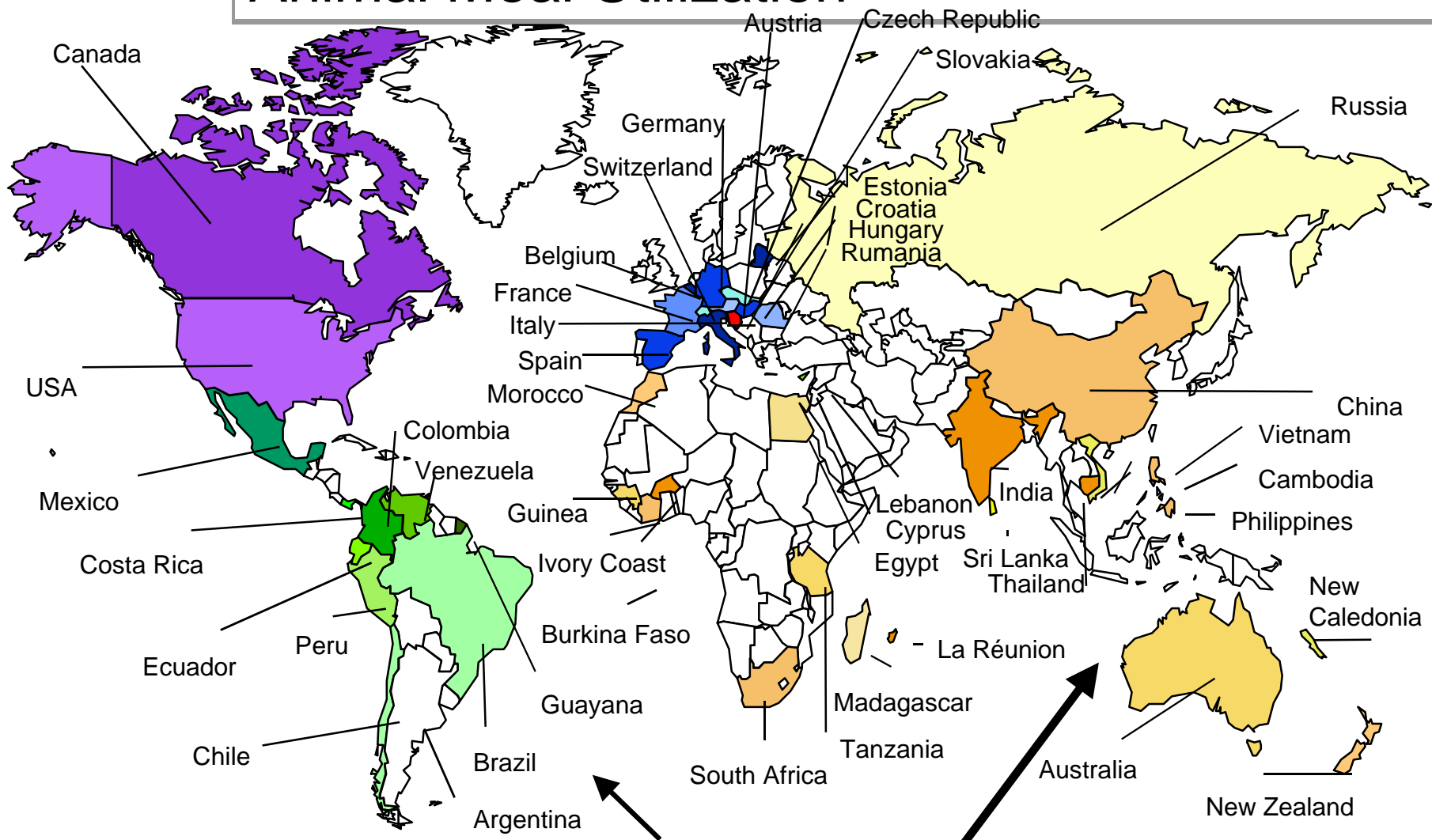


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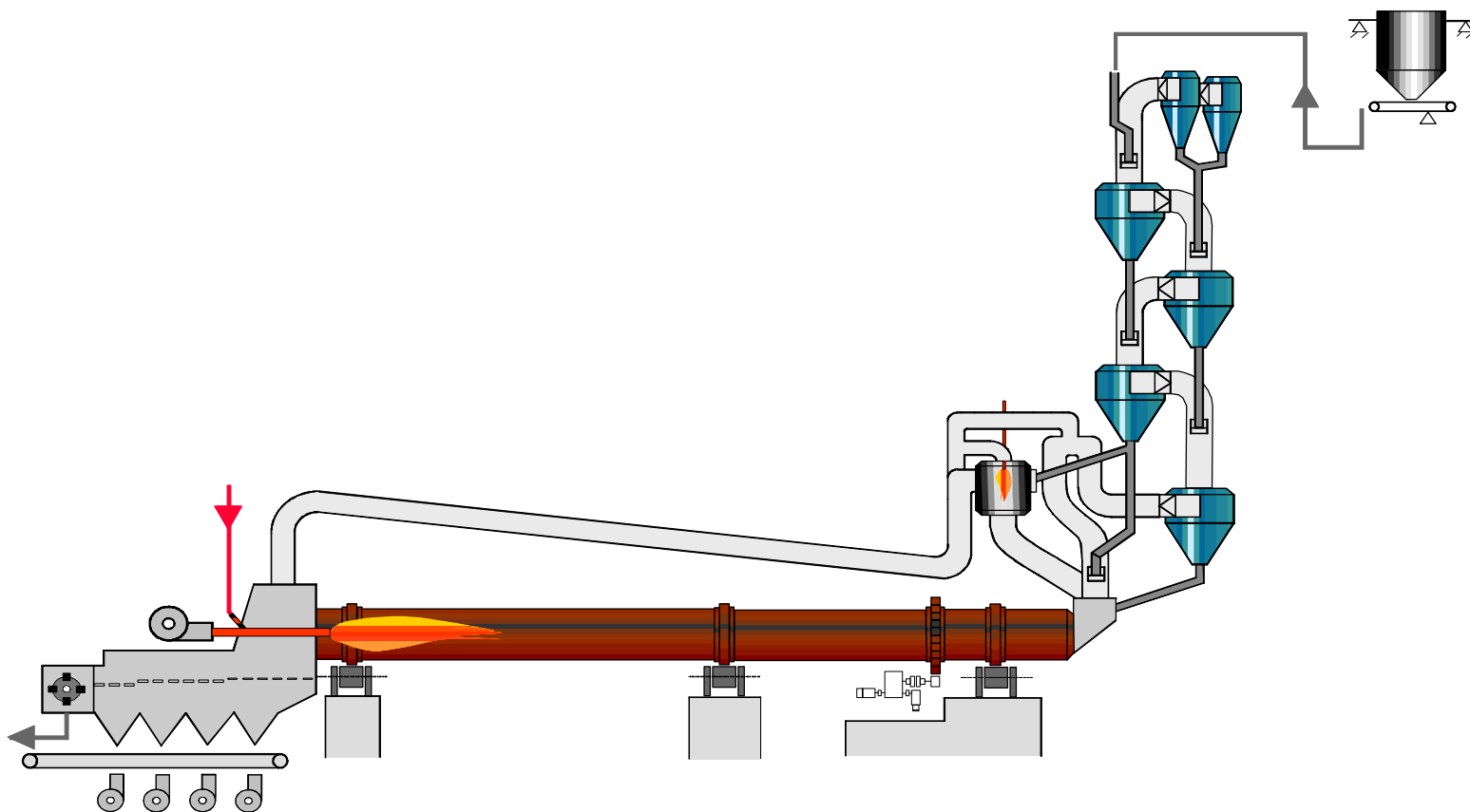
Animal Meal Utilization



Group companies and affiliates

Animal Meal Utilization

- Cement Kilns



Animal Meal Utilization

- Animal meal pretreated to reduce potential infection
 - ▶ 133 degrees C (~ 271 degrees F)
 - ▶ 3 bar (~44 psi)
 - ▶ 20 minutes

- Personal protection
 - ▶ Gloves
 - ▶ Face masks
 - ▶ Washing hands after handling equipment used to convey animal meal
 - ▶ Showering after work

Animal Meal Utilization

- Important input specifications
 - ▶ Chlorine – varies but generally < 0.5%
 - ▶ P_2O_5 – keep to < 1% in clinker
 - ▶ Heat value – 15 to 18 MJ/kg (~6,300 – 8,200 BTU/lb)
 - ▶ Water – kept between 4% - 7%
 - ▶ Grease content – kept to < 8%

Animal Meal Utilization

- Handling
 - ▶ Delivery - closed pneumatic RR cars or PD trucks
 - ▶ Storage at the plant - closed silos
 - ▶ Dosing system – closed feed hopper, variable speed belt scale, dedusting system
 - ▶ Transport to kiln – pneumatic (60,000 – 74,000 cfm)
 - Short lines recommended
 - ▶ Fed into the kiln at main burner or pre-calciner

Animal Meal Utilization

- History

- ▶ General ban of feeding animal meal in Switzerland and in Europe since 2000.
 - Switzerland - minimum 5 years
 - Europe – minimum 6 months
- ▶ Transboundary shipments of animal meal very difficult
- ▶ Cement kilns the only solution contemplated in Switzerland
- ▶ Two key plants have burned about 7,500 metric tons of animal meal

Animal Meal Utilization

- Future
 - ▶ Holcim business plan forecast
 - 2005
 - 30,000 metric tons of animal
 - 5 plants
 - ▶ Handling facilities costs
 - 200,000 – 650,000 Euros

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